SEQUENCE LISTING

(1) GENERAL INFORMATION:

  (i) APPLICANT: Crabtree, Gerald R.
                             Schreiber, Stuart L.
                             Spencer, David M.
                             Wandless, Thomas J.
                             Belshaw, Peter

  (ii) TITLE OF INVENTION: REGULATED APOPTOSIS

(iii) NUMBER OF SEQUENCES: 81

 (iv) CORRESPONDENCE ADDRESS:
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  (v) COMPUTER READABLE FORM:
     (A) MEDIUM TYPE: Floppy disk
     (B) COMPUTER: IBM PC compatible
     (C) OPERATING SYSTEM: PC-DOS/MS-DOS
     (D) SOFTWARE: PatentIn Release #1.0, Version #1.25

 (vi) CURRENT APPLICATION DATA:
     (A) APPLICATION NUMBER: 09/302,629
     (B) FILING DATE: 30-April-1999
     (C) CLASSIFICATION:

(viii) ATTORNEY/AGENT INFORMATION:
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     (C) REFERENCE/DOCKET NUMBER: APV-317.07

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(2) INFORMATION FOR SEQ ID NO:1:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 14 amino acids
        (B) TYPE: amino acid
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: peptide

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Met Gly Ser Ser Lys Ser Lys Pro Lys Asp Pro Ser Gln Arg
1   5   10

(2) INFORMATION FOR SEQ ID NO:2:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 11 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

GTTAAGTTAA C

(2) INFORMATION FOR SEQ ID NO:3:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 11 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

TGACTCAGCG C

(2) INFORMATION FOR SEQ ID NO:4:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 33 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION: 6..11
     (D) OTHER INFORMATION: /note= "Sac II restriction site."

(ix) FEATURE:
     (A) NAME/KEY: misc_signal
     (B) LOCATION: 12..16
     (D) OTHER INFORMATION: /note= "Kozak sequence."

(ix) FEATURE:
     (A) NAME/KEY: CDS
     (B) LOCATION: 17..31

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION: 17..33
     (D) OTHER INFORMATION: /note= "Region of homology with target sequence."

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

```
CGACACCGCG GCCACC ATG GCC ACA ATT GGA GC
                  Met Ala Thr Ile Gly
                  1                5
```


(2) INFORMATION FOR SEQ ID NO:5:

    (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 5 amino acids
      (B) TYPE: amino acid
      (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: protein

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

```
Met Ala Thr Ile Gly
1                5
```

(2) INFORMATION FOR SEQ ID NO:6:

    (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 27 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: single
      (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION: 6..11
    (D) OTHER INFORMATION: /note= "Xho I restriction site."

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION: 12..27
    (D) OTHER INFORMATION: /note= "Region of homology with
target sequence."

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

CGACACTCGA GAGCCCATGA CTTCTGG

(2) INFORMATION FOR SEQ ID NO:7:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 4 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: peptide

    (ix) FEATURE:
        (A) NAME/KEY: Peptide
        (B) LOCATION: 1..4
        (D) OTHER INFORMATION: /note= "Translation product of
        complement of SEQ ID NO:6, bases 9 to 20."

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

    Ser Trp Ala Leu
    1

(2) INFORMATION FOR SEQ ID NO:8:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 41 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 6..11
        (D) OTHER INFORMATION: /note= "Xho I restriction site."

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 12..41
        (D) OTHER INFORMATION: /note= "Region of homology with
            target sequence."

    (ix) FEATURE:
        (A) NAME/KEY: CDS
        (B) LOCATION: 9..41

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 28
        (D) OTHER INFORMATION: /note= "A to G."

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

```
CGACACTC GAG CTC TGC TAC TTG CTA GGT GGA ATC CTC TTC      41
         Glu Leu Cys Tyr Leu Leu Gly Gly Ile Leu Phe
          1               5                    10
```

(2) INFORMATION FOR SEQ ID NO:9:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 11 amino acids
        (B) TYPE: amino acid
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: protein

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

```
Glu Leu Cys Tyr Leu Leu Gly Gly Ile Leu Phe
 1               5                    10
```

(2) INFORMATION FOR SEQ ID NO:10:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 24 base pairs

(B) TYPE: nucleic acid
          (C) STRANDEDNESS: single
          (D) TOPOLOGY: linear

     (ii) MOLECULE TYPE: cDNA

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION: 3..8
          (D) OTHER INFORMATION: /note= "Eco RI restriction site."

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION: 9..24
          (D) OTHER INFORMATION: /note= "Region of homology with
     target sequence."

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION: 24
          (D) OTHER INFORMATION: /note= "G to C."

     (ix) FEATURE:
          (A) NAME/KEY: misc_signal
          (B) LOCATION: complement (9..11)
          (D) OTHER INFORMATION: /note= "Translational stop encoded
     in complementary strand."

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

GCGAATTCTT AGCGAGGGGC CAGC

(2) INFORMATION FOR SEQ ID NO:11:

     (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 4 amino acids
          (B) TYPE: amino acid
          (C) STRANDEDNESS: single
          (D) TOPOLOGY: linear

     (ii) MOLECULE TYPE: peptide

     (ix) FEATURE:
          (A) NAME/KEY: Peptide
          (B) LOCATION: 1..4
          (D) OTHER INFORMATION: /note= "Translational product of
     complement to SEQ ID NO:10, bases 12 to 23."

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

     Leu Ala Pro Arg
     1

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 33 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: single
             (D) TOPOLOGY: linear

       (ii) MOLECULE TYPE: cDNA

       (ix) FEATURE:
             (A) NAME/KEY: misc_feature
             (B) LOCATION: 3..8
             (D) OTHER INFORMATION: /note= "Eco RI restriction."

       (ix) FEATURE:
             (A) NAME/KEY: misc_feature
             (B) LOCATION: 12..17
             (D) OTHER INFORMATION: /note= "Sal I restriction site."

       (ix) FEATURE:
             (A) NAME/KEY: misc_signal
             (B) LOCATION: complement (9..11)
             (D) OTHER INFORMATION: /note= "Translational stop signal
        encoded on complementary strand."

       (ix) FEATURE:
             (A) NAME/KEY: misc_feature
             (B) LOCATION: 18..33
             (D) OTHER INFORMATION: /note= "Region of homology with
        target sequence."

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

GCGAATTCTT AGTCGACGCG AGGGGCCAGG GTC

(2) INFORMATION FOR SEQ ID NO:13:

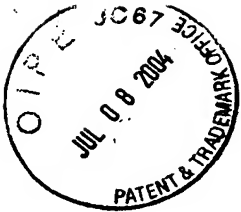   (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 4 amino acids
             (B) TYPE: amino acid
             (C) STRANDEDNESS: single
             (D) TOPOLOGY: linear

       (ii) MOLECULE TYPE: peptide

       (ix) FEATURE:
             (A) NAME/KEY: Peptide
             (B) LOCATION: 1..4
             (D) OTHER INFORMATION: /note= "Translational product of
        complement to SEQ ID NO:12, bases 18 to 29."

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

        Leu Ala Pro Arg

1

(2) INFORMATION FOR SEQ ID NO:14:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 25 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 4..9
        (D) OTHER INFORMATION: /note= "Xho I restriction site."

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 13
        (D) OTHER INFORMATION: /note= "T to G."

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 4..25
        (D) OTHER INFORMATION: /note= "Region of homology with
        target sequence."

    (ix) FEATURE:
        (A) NAME/KEY: CDS
        (B) LOCATION: 10..24

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

25

GGGCTCGAG CTC GGC TAC TTG CTA G
        Leu Gly Tyr Leu Leu
        1   5

(2) INFORMATION FOR SEQ ID NO:15:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 5 amino acids
        (B) TYPE: amino acid
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: protein

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

Leu Gly Tyr Leu Leu
1   5

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:
    (A) LENGTH: 26 base pairs
    (B) TYPE: nucleic acid
    (C) STRANDEDNESS: single
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION: 6..11
    (D) OTHER INFORMATION: /note= "Xho I restriction site."

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION: 12..26
    (D) OTHER INFORMATION: /note= "Region of homology with
target sequence."

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

CGACACTCGA GGTGACGGAC AAGGTC

(2) INFORMATION FOR SEQ ID NO:17:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 26 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 6..11
        (D) OTHER INFORMATION: /note= "Sal I restriction site."

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 12..26
        (D) OTHER INFORMATION: /note= "Region of homology with
target sequence."

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

CGACAGTCGA CCCAATCAGG GACCTC

(2) INFORMATION FOR SEQ ID NO:18:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 33 base pairs
        (B) TYPE: nucleic acid

```
          (C)  STRANDEDNESS: single
          (D)  TOPOLOGY: linear

    (ii)  MOLECULE TYPE: cDNA


    (ix)  FEATURE:
          (A)  NAME/KEY: misc_feature
          (B)  LOCATION: 1..5
          (D)  OTHER INFORMATION: /note= "Xho I restriction site."

    (ix)  FEATURE:
          (A)  NAME/KEY: misc_feature
          (B)  LOCATION: 10..15
          (D)  OTHER INFORMATION: /note= "Bsi WI restriction site."

    (ix)  FEATURE:
          (A)  NAME/KEY: CDS
          (B)  LOCATION: 6..32


   (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:18:
```

33

```
TCGAG TAT CCG TAC GAC GTA CCA GAC TAC GCA G
      Tyr Pro Tyr Asp Val Pro Asp Tyr Ala
       1               5


(2)  INFORMATION FOR SEQ ID NO:19:

      (i)  SEQUENCE CHARACTERISTICS:
          (A)  LENGTH: 9 amino acids
          (B)  TYPE: amino acid
          (D)  TOPOLOGY: linear

     (ii)  MOLECULE TYPE: protein

     (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:19:

Tyr Pro Tyr Asp Val Pro Asp Tyr Ala
 1               5


(2)  INFORMATION FOR SEQ ID NO:20:

      (i)  SEQUENCE CHARACTERISTICS:
          (A)  LENGTH: 33 base pairs
          (B)  TYPE: nucleic acid
          (C)  STRANDEDNESS: single
          (D)  TOPOLOGY: linear

     (ii)  MOLECULE TYPE: cDNA


     (ix)  FEATURE:
          (A)  NAME/KEY: misc_feature
          (B)  LOCATION: 1..5
```

(D) OTHER INFORMATION: /note= "Sal I restriction site."

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

    TCGACTGCGT AGTCTGGTAC GTCGTACGGA TAC   33

(2) INFORMATION FOR SEQ ID NO:21:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 33 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

       (ii) MOLECULE TYPE: cDNA

       (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION: 1..5
            (D) OTHER INFORMATION: /note= "Sal I restriction site."

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

    TCGACTATCC GTACGACGTA CCAGACTACG CAC   33

(2) INFORMATION FOR SEQ ID NO:22:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 33 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

       (ii) MOLECULE TYPE: cDNA

       (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION: 1..5
            (D) OTHER INFORMATION: /note= "Xho I restriction site."

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

    TCGAGTGCGT AGTCTGGTAC GTCGTACGGA TAG   33

(2) INFORMATION FOR SEQ ID NO:23:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 80 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION: 6..11
     (D) OTHER INFORMATION: /note= "Sac II restriction site."

(ix) FEATURE:
     (A) NAME/KEY: misc_signal
     (B) LOCATION: 12..16
     (D) OTHER INFORMATION: /note= "Kozak sequence."

(ix) FEATURE:
     (A) NAME/KEY: misc_signal
     (B) LOCATION: 17..58
     (D) OTHER INFORMATION: /note= "Myristoylation signal."

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION: 59..64
     (D) OTHER INFORMATION: /note= "Xho I restriction site."

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION: 65..80
     (D) OTHER INFORMATION: /note= "Zeta homology."

(ix) FEATURE:
     (A) NAME/KEY: CDS
     (B) LOCATION: 17..79

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

```
CGACACCGCG GCCACC ATG GGG AGT AGC AAG AGC AAG CCT AAG GAC CCC          4S
                  Met Gly Ser Ser Lys Ser Lys Pro Lys Asp Pro
                   1               5                   10

AGC CAG CGC CTC GAG AGG AGT GCA GAG ACT G                             80
Ser Gln Arg Leu Glu Arg Ser Ala Glu Thr
             15                  20
```


(2) INFORMATION FOR SEQ ID NO:24:

     (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 21 amino acids
          (B) TYPE: amino acid
          (D) TOPOLOGY: linear

     (ii) MOLECULE TYPE: protein

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

Met Gly Ser Ser Lys Ser Lys Pro Lys Asp Pro Ser Gln Arg Leu Glu

Arg Ser Ala Glu Thr
               20

(2) INFORMATION FOR SEQ ID NO:25:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 27 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

   (ii) MOLECULE TYPE: cDNA

   (ix) FEATURE:
        (A) NAME/KEY: CDS
        (B) LOCATION: 12..26

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 6..11
        (D) OTHER INFORMATION: /note= "Xho I restriction site."

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 12..27
        (D) OTHER INFORMATION: /note= "Region of homology with
 target sequence."

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

                                                                          27
CGACACTCGA G GAG CTC TGT GAC GAT G
               Glu Leu Cys Asp Asp
                1   5
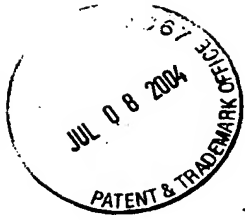

 (2) INFORMATION FOR SEQ ID NO:26:

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 5 amino acids
         (B) TYPE: amino acid
         (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: protein

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

  Glu Leu Cys Asp Asp
   1   5

 (2) INFORMATION FOR SEQ ID NO:27:

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 41 base pairs
         (B) TYPE: nucleic acid

```
           (C)  STRANDEDNESS: single
           (D)  TOPOLOGY: linear

     (ii)  MOLECULE TYPE: cDNA


     (ix)  FEATURE:
           (A)  NAME/KEY: misc_feature
           (B)  LOCATION: 6..11
           (D)  OTHER INFORMATION: /note= "Xho I restriction site."

     (ix)  FEATURE:
           (A)  NAME/KEY: misc_feature
           (B)  LOCATION: 12..41
           (D)  OTHER INFORMATION: /note= "Region of homology with
     target sequence."

     (ix)  FEATURE:
           (A)  NAME/KEY: misc_feature
           (B)  LOCATION: 27..29
           (D)  OTHER INFORMATION: /note= "GAT to AAG."

     (ix)  FEATURE:
           (A)  NAME/KEY: CDS
           (B)  LOCATION: 9..41
```

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

```
CGACACTC GAG CTC TGC TAC TTG CTA AAG GGA ATC CTC TTC       41
         Glu Leu Cys Tyr Leu Leu Lys Gly Ile Leu Phe
          1               5                   10
```

(2) INFORMATION FOR SEQ ID NO:28:

```
           (i)  SEQUENCE CHARACTERISTICS:
                (A)  LENGTH: 11 amino acids
                (B)  TYPE: amino acid
                (D)  TOPOLOGY: linear

          (ii)  MOLECULE TYPE: protein

          (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:28:

     Glu Leu Cys Tyr Leu Leu Lys Gly Ile Leu Phe
      1               5                   10
```

(2) INFORMATION FOR SEQ ID NO:29:

```
           (i)  SEQUENCE CHARACTERISTICS:
                (A)  LENGTH: 44 base pairs
                (B)  TYPE: nucleic acid
                (C)  STRANDEDNESS: single
                (D)  TOPOLOGY: linear

          (ii)  MOLECULE TYPE: cDNA
```

(ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 6..11
        (D) OTHER INFORMATION: /note= "Xho I restriction site."

(ix) FEATURE:
        (A) NAME/KEY: CDS
        (B) LOCATION: 9..44

(ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 27..44
        (D) OTHER INFORMATION: /note= "Region of homology with
target sequence."

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

CGACACTC GAG CTG CTG GAT CCG AAG CTC TGC TAC TTG CTA AAG   44
         Glu Leu Leu Asp Pro Lys Leu Cys Tyr Leu Leu Lys
          1   5   10

(2) INFORMATION FOR SEQ ID NO:30:

        (i) SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 12 amino acids
                (B) TYPE: amino acid
                (D) TOPOLOGY: linear

        (ii) MOLECULE TYPE: protein

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

Glu Leu Leu Asp Pro Lys Leu Cys Tyr Leu Leu Lys
 1   5   10

(2) INFORMATION FOR SEQ ID NO:31:

        (i) SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 31 base pairs
                (B) TYPE: nucleic acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii) MOLECULE TYPE: cDNA

        (ix) FEATURE:
                (A) NAME/KEY: misc_feature
                (B) LOCATION: 6..11
                (D) OTHER INFORMATION: /note= "Xho I restriction site."

        (ix) FEATURE:
                (A) NAME/KEY: misc_feature
                (B) LOCATION: 12..31

(D) OTHER INFORMATION: /note= "Region of homology with
target sequence."

(ix) FEATURE:
        (A) NAME/KEY: CDS
        (B) LOCATION: 9..31

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

CGACACTC GAG ACA ACA GAG TAC CAG GTA GC   31
         Glu Thr Thr Glu Tyr Gln Val Ala
          1   5

(2) INFORMATION FOR SEQ ID NO:32:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 8 amino acids
            (B) TYPE: amino acid
            (D) TOPOLOGY: linear

        (ii) MOLECULE TYPE: protein

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

Glu Thr Thr Glu Tyr Gln Val Ala
 1   5

(2) INFORMATION FOR SEQ ID NO:33:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 28 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

        (ii) MOLECULE TYPE: cDNA

        (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION: 6..11
            (D) OTHER INFORMATION: /note= "Xho I restriction site."

        (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION: 12..28
            (D) OTHER INFORMATION: /note= "Region of homology with
target sequence."

        (ix) FEATURE:
            (A) NAME/KEY: CDS
            (B) LOCATION: 9..28

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

```
CGACACTC GAG GGC GTG CAG GTG GAG AC
         Glu Gly Val Gln Val Glu Thr
          1           5
```

(2) INFORMATION FOR SEQ ID NO:34:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 7 amino acids
        (B) TYPE: amino acid
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: protein

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

```
Glu Gly Val Gln Val Glu Thr
 1           5
```

(2) INFORMATION FOR SEQ ID NO:35:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 27 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 6..11
        (D) OTHER INFORMATION: /note= "Sal I restriction site."

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 12..27
        (D) OTHER INFORMATION: /note= "Region of homology with
target sequence."

    (ix) FEATURE:
        (A) NAME/KEY: CDS
        (B) LOCATION: complement (9..26)

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

```
CGACAGTCGA CTTCCAGTTT TAGAAGC
```

(2) INFORMATION FOR SEQ ID NO:36:

    (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 6 amino acids
        (B) TYPE: amino acid
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: protein

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

Leu Leu Lys Leu Glu Val
 1   5

(2) INFORMATION FOR SEQ ID NO:37:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 27 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 7..12
        (D) OTHER INFORMATION: /note= "Xho I restriction site."

    (ix) FEATURE:
        (A) NAME/KEY: CDS
        (B) LOCATION: 10..27

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 13..27
        (D) OTHER INFORMATION: /note= "Region of homology with
    target sequence."

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

TCGACACTC GAG ACG GGG GCC GAG GGC   27
          Glu Thr Gly Ala Glu Gly
           1   5

(2) INFORMATION FOR SEQ ID NO:38:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 6 amino acids
        (B) TYPE: amino acid
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: protein

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

Glu Thr Gly Ala Glu Gly
 1   5

(2) INFORMATION FOR SEQ ID NO:39:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 28 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

   (ii) MOLECULE TYPE: cDNA

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 7..12
        (D) OTHER INFORMATION: /note= "Sal I restriction site."

   (ix) FEATURE:
        (A) NAME/KEY: CDS
        (B) LOCATION: complement (10..18)

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 13..28
        (D) OTHER INFORMATION: /note= "Region of homology with
target sequence."

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

CCGACAGTCG ACCTCTATTT TGAGCAGC   28

(2) INFORMATION FOR SEQ ID NO:40:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3 amino acids
        (B) TYPE: amino acid
        (D) TOPOLOGY: linear

   (ii) MOLECULE TYPE: protein

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

  Ile Glu Val
    1

(2) INFORMATION FOR SEQ ID NO:41:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 38 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

   (ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

CGACACCGCG GCCACCATGA AGCTACTGTC TTCTATCG   38

(2) INFORMATION FOR SEQ ID NO:42:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 28 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

CGACAGTCGA CCGATACAGT CAACTGTC   28

(2) INFORMATION FOR SEQ ID NO:43:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 38 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 6..11
        (D) OTHER INFORMATION: /note= "Sac II restriction site."

    (ix) FEATURE:
        (A) NAME/KEY: misc_signal
        (B) LOCATION: 12..16
        (D) OTHER INFORMATION: /note= "Kozak sequence."

    (ix) FEATURE:
        (A) NAME/KEY: CDS
        (B) LOCATION: 17..37

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 17..38
        (D) OTHER INFORMATION: /note= "Gal4 (1-147) coding
region."

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

CGACACCGCG GCCACC ATG AAG CTA CTG TCT TCT ATC G   38
                  Met Lys Leu Leu Ser Ser Ile
                  1   5

(2) INFORMATION FOR SEQ ID NO:44:

        (i) SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 7 amino acids
              (B) TYPE: amino acid
              (D) TOPOLOGY: linear

       (ii) MOLECULE TYPE: protein

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

    Met Lys Leu Leu Ser Ser Ile
     1   5

(2) INFORMATION FOR SEQ ID NO:45:

        (i) SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 28 base pairs
              (B) TYPE: nucleic acid   .
              (C) STRANDEDNESS: double
              (D) TOPOLOGY: linear

       (ii) MOLECULE TYPE: cDNA

       (ix) FEATURE:
              (A) NAME/KEY: misc_feature
              (B) LOCATION: 1..17
              (D) OTHER INFORMATION: /note= "Region encoding for
    C-terminal end of Ga14 (1-147)."

       (ix) FEATURE:
              (A) NAME/KEY: CDS
              (B) LOCATION: 3..17

       (ix) FEATURE:
              (A) NAME/KEY: misc_feature
              (B) LOCATION: 18..23
              (D) OTHER INFORMATION: /note= "Sal I restriction site."

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

    GA CAG TTG ACT GTA TCG GTCGACTGTC G
       Arg Gln Leu Thr Val Ser
        1   5

(2) INFORMATION FOR SEQ ID NO:46:

        (i) SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 6 amino acids
              (B) TYPE: amino acid   .
              (D) TOPOLOGY: linear

       (ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

Arg Gln Leu Thr Val Ser
 1   5

(2) INFORMATION FOR SEQ ID NO:47:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 34 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

CGACACCGCG GCCACCATGG TTTCTAAGCT GAGC   34

(2) INFORMATION FOR SEQ ID NO:48:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 28 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

CGACAGTCGA CCAACTTGTG CCGGAAGG   28

(2) INFORMATION FOR SEQ ID NO:49:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 34 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 6..11
        (D) OTHER INFORMATION: /note= "Sac II restriction site."

    (ix) FEATURE:
        (A) NAME/KEY: misc_signal
        (B) LOCATION: 12..16

(D) OTHER INFORMATION: /note= "Kozak sequence."

    (ix) FEATURE:
          (A) NAME/KEY: CDS
          (B) LOCATION: 17..34

    (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION: 17..34
          (D) OTHER INFORMATION: /note= "Region encoding N-terminal
               end of HNF1 (1281)."

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

CGACACCGCG GCCACC ATG GTT TCT AAG CTG AGC   34
                   Met Val Ser Lys Leu Ser
                    1   5

(2) INFORMATION FOR SEQ ID NO:50:

        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 6 amino acids
             (B) TYPE: amino acid
             (D) TOPOLOGY: linear

       (ii) MOLECULE TYPE: protein

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

Met Val Ser Lys Leu Ser
 1   5

(2) INFORMATION FOR SEQ ID NO:51:

        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 28 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: double
             (D) TOPOLOGY: linear

       (ii) MOLECULE TYPE: cDNA

       (ix) FEATURE:
             (A) NAME/KEY: misc_feature
             (B) LOCATION: 1..20
             (D) OTHER INFORMATION: /note= "Region encoding for
C-terminal end of HNF1 (1-282)."

       (ix) FEATURE:
             (A) NAME/KEY: CDS
             (B) LOCATION: 3..17

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

CC TTC CGG CAC AAG TTG GTCGACTGTC G
Ala Phe Arg His Lys Leu
 1   5

(2) INFORMATION FOR SEQ ID NO:52:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 6 amino acids
            (B) TYPE: amino acid
            (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: protein

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

Ala Phe Arg His Lys Leu
 1   5

(2) INFORMATION FOR SEQ ID NO:53:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 11 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: both
            (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (ix) FEATURE:
            (A) NAME/KEY: misc_signal
            (B) LOCATION: 3..7
            (D) OTHER INFORMATION: /note= "Kozak sequence."

    (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION: 1..11
            (D) OTHER INFORMATION: /note= "Complementary to bases 5 to
        15 of SEQ ID NO:54."

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

11

GGCCACCATG C

(2) INFORMATION FOR SEQ ID NO:54:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 3 amino acids
            (B) TYPE: amino acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

(ix) FEATURE:
    (A) NAME/KEY: Peptide
    (B) LOCATION: 1..3
    (D) OTHER INFORMATION: /note= "Translation product of SEQ
   ID NO:53 and SEQ ID NO:55. Translational start
site at base 8 of SEQ ID NO:53."

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

Met Leu Glu
1

(2) INFORMATION FOR SEQ ID NO:55:

    (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 17 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: both
      (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION: 14..17
      (D) OTHER INFORMATION: /note= "Sac II restriction site
  overhang."

    (ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION: 1..5
      (D) OTHER INFORMATION: /note= "Xho I restriction site
  overhang."

    (ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION: 5..15
      (D) OTHER INFORMATION: /note= "Complementary to bases 1 to
  11 of SEQ ID NO:53."

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

TCGAGCATGG TGGCCGC

(2) INFORMATION FOR SEQ ID NO:56:

    (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 27 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: single
      (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

TCGACCCTAA GAMGAAGAGA AAGGTAC

(2) INFORMATION FOR SEQ ID NO:57:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 27 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

TCGAGTACCT TTCTCTTCKT CTTAGGG

(2) INFORMATION FOR SEQ ID NO:58:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 27 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: both
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 1..5
        (D) OTHER INFORMATION: /note= "Sal I restriction site
overhang."

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION: 5..27
        (D) OTHER INFORMATION: /note= "Complementary to SEQ ID
NO:60, bases 5 to 27."

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

TCGACCCTAA GAAGAAGAGA AAGGTAC

(2) INFORMATION FOR SEQ ID NO:59:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 11 amino acids
        (B) TYPE: amino acid
        (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

     (ix) FEATURE:
          (A) NAME/KEY: Peptide
          (B) LOCATION: 1..11
          (D) OTHER INFORMATION: /note= "Translation product of SEQ
     ID NOS:58 and 60."

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

     Leu Asp Pro Lys Lys Lys Arg Lys Val Leu Glu
     1   5   10

(2) INFORMATION FOR SEQ ID NO:60:

     (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 27 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: both
          (D) TOPOLOGY: linear

     (ii) MOLECULE TYPE: cDNA

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION: 1..5
          (D) OTHER INFORMATION: /note= "Xho I restriction site
     overhang."

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION: 5..27
          (D) OTHER INFORMATION: /note= "Complementary to SEQ ID
     NO:58, bases 5 to 27."

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

TCGAGTACCT TTCTCTTCTT CTTAGGG

(2) INFORMATION FOR SEQ ID NO:61:

     (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 29 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: single
          (D) TOPOLOGY: linear

     (ii) MOLECULE TYPE: cDNA

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:61:

CGACAGTCGA CGCCCCCCCG ACCGATGTC

(2) INFORMATION FOR SEQ ID NO:62:

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 26 base pairs
       (B) TYPE: nucleic acid.
       (C) STRANDEDNESS: single
       (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:62:

CGACACTCGA GCCCACCGTA CTCGTC

(2) INFORMATION FOR SEQ ID NO:63:

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 29 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: single
       (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION: 6..11
       (D) OTHER INFORMATION: /note= "Sal I restriction site."

    (ix) FEATURE:
       (A) NAME/KEY: CDS
       (B) LOCATION: 12..29

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION: 12..29
       (D) OTHER INFORMATION: /note= "Region encoding N-terminal
end of VP16 (413-490)."

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:63:

CGACAGTCGA C GCC CCC CCG ACC GAT GTC
           Ala Pro Pro Thr Asp Val
         1   5

(2) INFORMATION FOR SEQ ID NO:64:

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 6 amino acids

```
            (B)  TYPE:  amino acid
            (D)  TOPOLOGY:  linear

      (ii)  MOLECULE TYPE:  protein

      (xi)  SEQUENCE DESCRIPTION:  SEQ ID NO:64:

Ala Pro Pro Thr Asp Val
  1               5

(2)  INFORMATION FOR SEQ ID NO:65:

      (i)  SEQUENCE CHARACTERISTICS:
            (A)  LENGTH:  26 base pairs
            (B)  TYPE:  nucleic acid
            (C)  STRANDEDNESS:  double
            (D)  TOPOLOGY:  linear

      (ii)  MOLECULE TYPE:  cDNA


      (ix)  FEATURE:
            (A)  NAME/KEY:  CDS
            (B)  LOCATION:  1..15

      (ix)  FEATURE:
            (A)  NAME/KEY:  misc_feature
            (B)  LOCATION:  1..15
            (D)  OTHER INFORMATION:  /note= "Region encoding C-terminal
                 end of VP16 (413-490)."


      (xi)  SEQUENCE DESCRIPTION:  SEQ ID NO:65:
                                                                    26
GAC GAG TAC GGT GGG CTCGAGTGTC G
Asp Glu Tyr Gly Gly
  1               5


(2)  INFORMATION FOR SEQ ID NO:66:

      (i)  SEQUENCE CHARACTERISTICS:
            (A)  LENGTH:  5 amino acids
            (B)  TYPE:  amino acid
            (D)  TOPOLOGY:  linear

      (ii)  MOLECULE TYPE:  protein

      (xi)  SEQUENCE DESCRIPTION:  SEQ ID NO:66:

Asp Glu Tyr Gly Gly
  1               5


(2)  INFORMATION FOR SEQ ID NO:67:

      (i)  SEQUENCE CHARACTERISTICS:
```

(A) LENGTH: 23 base pairs
                    (B) TYPE: nucleic acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

          (ii) MOLECULE TYPE: cDNA

          (xi) SEQUENCE DESCRIPTION: SEQ ID NO:67:

GGAATTCCAT ATGGGCGTGC AGG   23

(2) INFORMATION FOR SEQ ID NO:68:

          (i) SEQUENCE CHARACTERISTICS:
                    (A) LENGTH: 5 amino acids
                    (B) TYPE: amino acid
                    (D) TOPOLOGY: linear

          (ii) MOLECULE TYPE: peptide

          (xi) SEQUENCE DESCRIPTION: SEQ ID NO:68:

His Met Gly Val Gln
  1   5

(2) INFORMATION FOR SEQ ID NO:69:

          (i) SEQUENCE CHARACTERISTICS:
                    (A) LENGTH: 39 base pairs
                    (B) TYPE: nucleic acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

          (ii) MOLECULE TYPE: cDNA

          (xi) SEQUENCE DESCRIPTION: SEQ ID NO:69:

CTGTCCCGGG ANNNNNNNNN TTTCTTTCCA TCTTCAAGC   39

(2) INFORMATION FOR SEQ ID NO:70:

          (i) SEQUENCE CHARACTERISTICS:
                    (A) LENGTH: 11 amino acids
                    (B) TYPE: amino acid
                    (D) TOPOLOGY: linear

          (ii) MOLECULE TYPE: peptide

          (xi) SEQUENCE DESCRIPTION: SEQ ID NO:70:

Arg Ser Xaa Xaa Xaa Lys Lys Gly Asp Glu Leu
  1   5   10

(2) INFORMATION FOR SEQ ID NO:71:

        (i) SEQUENCE CHARACTERISTICS:
           (A) LENGTH: 63 base pairs
           (B) TYPE: nucleic acid
           (C) STRANDEDNESS: single
           (D) TOPOLOGY: linear

        (ii) MOLECULE TYPE: cDNA

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:71:

CTGTCCCGGG AGGAATCAAA TTTCTTTCCA TCTTCAAGCA NNNNNNNNNG TGCACCACGC   60

AGG

(2) INFORMATION FOR SEQ ID NO:72:

        (i) SEQUENCE CHARACTERISTICS:
           (A) LENGTH: 19 amino acids
           (B) TYPE: amino acid
           (D) TOPOLOGY: linear

        (ii) MOLECULE TYPE: peptide

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:72:

Arg Ser Ser Asp Phe Lys Lys Gly Asp Glu Leu Met Xaa Xaa Xaa His
1   5   10   15

Val Val Cys

(2) INFORMATION FOR SEQ ID NO:73:

        (i) SEQUENCE CHARACTERISTICS:
           (A) LENGTH: 57 base pairs
           (B) TYPE: nucleic acid
           (C) STRANDEDNESS: single
           (D) TOPOLOGY: linear

        (ii) MOLECULE TYPE: cDNA

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:73:

CGCGGATCCT CATTCCAGTT TTAGAAGCTC CACATCNNNN NNNNNAGTGG CATGTGG   57

(2) INFORMATION FOR SEQ ID NO:74:

        (i) SEQUENCE CHARACTERISTICS:
           (A) LENGTH: 15 amino acids
           (B) TYPE: amino acid
           (D) TOPOLOGY: linear

        (ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:74:

Glu Leu Lys Leu Leu Glu Val Asp Xaa Xaa Xaa Thr Ala His Pro
 1   5   10   15

(2) INFORMATION FOR SEQ ID NO:75:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 28 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

        (ii) MOLECULE TYPE: cDNA

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:75:

CGCGGATCCT CATTCCAGTT TTAGAAGC   28

(2) INFORMATION FOR SEQ ID NO:76:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 5 amino acids
            (B) TYPE: amino acid
            (D) TOPOLOGY: linear

        (ii) MOLECULE TYPE: peptide

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:76:

Glu Leu Lys Leu Leu
 1   5

(2) INFORMATION FOR SEQ ID NO:77:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 28 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

        (ii) MOLECULE TYPE: cDNA

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:77:

CGACAGTCGA CCGATACAGT CAACTGTC   28

(2) INFORMATION FOR SEQ ID NO:78:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 28 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:78:

CGACAGTCGA CCAACTTGTG CCGGAAGG   28

(2) INFORMATION FOR SEQ ID NO:79:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 17 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:79:

                                                                 17
TCGAGCATGG TGGCCGC

(2) INFORMATION FOR SEQ ID NO:80:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 27 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:80:

                                                                 27
TCGAGTACCT TTCTCTTCTT CTTAGGG

(2) INFORMATION FOR SEQ ID NO:81:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 26 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:81:

                                                                 26
CGACACTCGA GCCCACCGTA CTCGTC